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L10: Entry 12 of 15

File: USPT

Jan 18, 1994

US-PAT-NO: 5280612

DOCUMENT-IDENTIFIER: US 5280612 A

TITLE: Multiple version database concurrency control system

DATE-ISSUED: January 18, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lorie; Raymond A.	San Jose	CA		
Mohan; Chandrasekaran	San Jose	CA		
Pirahesh; Mir H.	San Jose	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
International Business Machines Corporation	Armonk NY				02

APPL-NO: 7/ 801769 [PALM]

DATE FILED: November 26, 1991

INT-CL: [5] G06F 15/40, G06F 12/00

US-CL-ISSUED: 395/600; 395/425, 364/DIG.1, 364/222.81, 364/222.82, 364/282.1, 364/281.1

US-CL-CURRENT: 707/8; 707/203, 707/206, 707/9, 710/242

FIELD-OF-SEARCH: 395/600, 395/650, 395/425

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>4627019</u>	December 1986	Ng	364/900
<input type="checkbox"/>	<u>4853843</u>	August 1989	Ecklund	364/200
<input type="checkbox"/>	<u>4875159</u>	October 1989	Cary et al.	364/200
<input type="checkbox"/>	<u>5043876</u>	August 1991	Terry	364/200

OTHER PUBLICATIONS

Chan, A. et al, "Implementing Distributed Read-Only Transactions", IEEE Transactions and Software Engineering, vol. SE-11, No. 2, Feb. 1985.

Robinson, J. et al, "Elimination of Lock Contention and Relational Databases Accessed by Read-Only Queries and On-Line Update Transactions", IBM Technical Disclosure Bulletin Jun. 1988, pp. 180-185, Jun. 1988.

Todd, S., "Concurrency Systems Suitable for Distributed Databases", IBM Technical Disclosure Bulletin Jun. 1978, pp. 383-386, Jun. 1978.

R. Bayer, H. Heller & A. Reiser, "Parallelism and Recovery in Database",

Transactions on Database Systems, vol. 5, No. 2, Jun. 1980.

David P. Reed, "Naming and Synchronization in a De-Centralized Computer System", Phd Thesis, Technical Report MIT/LTS/TR-205, Sep. 1978.

Richard E. Sterns, et al., "Distributed Database Concurrency Controls Using Before-Values", Proceedings of the Association for Computing Machinery SIGMOD International Conference on Management of Data, Ann Arbor, Michigan, Apr. 1981.

Arvola Chan, et al., "The Implementation of An Integrated Concurrency Control and Recovery Scheme", Proceedings of the Association for Computing Machinery SIGMOD International Conference on Management of Data, Orlando, Florida, Jun. 1982.

ART-UNIT: 237

PRIMARY-EXAMINER: Kulik; Paul V.

ATTY-AGENT-FIRM: Baker, Maxham, Jester & Meador

ABSTRACT:

An improved concurrency control system for application to a distributed concurrent transaction and query processing system using multi-version database records to overcome delays arising from lock conflicts. Read-only queries are afforded a consistent "stable state" of the database during the life of the query. Updating transactions requiring locks can proceed without waiting for the termination of long queries. At least two database versions are necessary, although availability of more versions permits long read-only queries to phase-out over time without forcing new queries to use aged "stable-state" data and without roll-back. Read-only queries can be terminated and converted to locking transactions to permit an update of the "stable state" database version before the queries would normally terminate. A novel record key structure having a plurality of substructures corresponding to the several database versions is used to access database records. Rapid selection of proper record version and efficient version tracking and updating is effected using several bit-mapped transaction index tables.

19 Claims, 14 Drawing figures

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L11: Entry 7 of 7

File: USPT

Jan 29, 1991

US-PAT-NO: 4989132

DOCUMENT-IDENTIFIER: US 4989132 A

TITLE: Object-oriented, logic, and database programming tool with garbage collection

DATE-ISSUED: January 29, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mellender; Fredric H.	Rochester	NY		
Straw; Andrew G.	Fairport	NY		
Riegel; Stephen E.	Pittsford	NY		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Eastman Kodak Company	Rochester	NY			02

APPL-NO: 7/ 261791 [PALM]

DATE FILED: October 24, 1988

INT-CL: [5] G06F 7/00

US-CL-ISSUED: 364/200; 364/513

US-CL-CURRENT: 717/139; 706/60, 707/206, 717/114, 717/140

FIELD-OF-SEARCH: 364/513, 364/200

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

☐ **Search Selected** **Search ALL**

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>3622762</u>	November 1971	Dyer et al.	235/150
<input type="checkbox"/>	<u>4546435</u>	October 1985	Herbert et al.	364/300
<input type="checkbox"/>	<u>4570217</u>	February 1986	Allen et al.	364/188
<input type="checkbox"/>	<u>4622545</u>	November 1986	Atkinson	340/747
<input type="checkbox"/>	<u>4635208</u>	January 1987	Coleby et al.	364/491
<input type="checkbox"/>	<u>4736320</u>	April 1988	Bristol	364/300

OTHER PUBLICATIONS

Pundy et al, Integrating an Object Server with Other Worlds, ACM Transactions, Jan. 1987.

ART-UNIT: 238

PRIMARY-EXAMINER: MacDonald; Allen R.

ATTY-AGENT-FIRM: Clos Thomas H.

ABSTRACT:

A programming tool is provided which integrates an object-oriented programming language system, a logic programming language system, and a database in such a manner that logic terms can be treated as objects in the object-oriented programming language system, objects can be treated as logic terms in the logic programming language system, and logic terms and objects are stored in the database in a common data structure format. Automatic management of the database is provided which is transparent to the user.

33 Claims, 23 Drawing figures

WEST**Freeform Search****Database:**

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L12 5873105.pn.1 L12

DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=OR

L11 L10 and section7 L11L10 L9 and key15 L10L9 L8 and data same record33 L9L8 (((707/206)!.CCLS.))and database same manag\$51 L8L7 ((707/\$)!.CCLS.)12688 L7L6 (((707/205)!.CCLS.))418 L6L5 (((707/204)!.CCLS.))418 L5L4 ((707/206)!.CCLS.)247 L4L3 l1 and ((707/206)!.CCLS.)18 L3L2 trash near manag\$18 L2L1 garbage near manag\$47 L1